

March 24-Month Study
Date: March 15, 2021

From: Water Resources Group, Salt Lake City
To: All Colorado River Annual Operating Plan (AOP) Recipients

Current Reservoir Status

| Reservoir | February Inflow (unregulated) (acre-feet) | Percent of Average (%) | March 14, Midnight Elevation (feet) | March 14, Midnight Reservoir Storage (acre-feet) |
|---------------|--|------------------------------|--|--|
| Fontenelle | 24,440 | 88 | 6,472.57 | 123,200 |
| Flaming Gorge | 31,000 | 70 | 6,024.79 | 3,152,450 |
| Blue Mesa | 20,290 | 91 | 7,465.79 | 403,600 |
| Navajo | 13,300 | 45 | 6,033.64 | 1,045,600 |
| Powell | 200,900 | 51 | 3,569.18 | 9,041,000 |

Expected Operations

The operation of Lake Powell and Lake Mead in this March 2021 24-Month Study is pursuant to the December 2007 Record of Decision on Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations of Lake Powell and Lake Mead (Interim Guidelines), and reflects the 2021 Annual Operating Plan (AOP). Pursuant to the Interim Guidelines, the August 2020 24-Month Study projections of the January 1, 2021, system storage and reservoir water surface elevations set the operational tier for the coordinated operation of Lake Powell and Lake Mead during 2021.

The August 2020 24-Month Study projected the January 1, 2021, Lake Powell elevation to be below the 2021 Equalization Elevation of 3,659 feet and above elevation 3,575 feet. Consistent with Section 6.B of the Interim Guidelines, Lake Powell will operate in the Upper Elevation Balancing Tier for water year 2021, with an initial water year release volume of 8.23 maf and the potential for an April adjustment to equalization or balancing releases in April 2021. Based on the most probable inflow forecast, this March 24-Month Study projects Lake Powell to remain in 6.B.1 with a release of 8.23 maf in water year 2021.

Consistent with Section 2.B.5 of the Interim Guidelines, the Intentionally Created Surplus (ICS) Surplus Condition is the criterion governing the operation of Lake Mead for calendar year 2021. In addition, Section III.B of Exhibit 1 to the Lower Basin Drought

Contingency Plan (DCP) Agreement is also governing the operation of Lake Mead in calendar year 2021.

The 2021 AOP is available for download at:

<https://www.usbr.gov/lc/region/g4000/aop/AOP21.pdf>.

The Interim Guidelines are available for download at:

<https://www.usbr.gov/lc/region/programs/strategies/RecordofDecision.pdf>.

The Colorado River DCPs are available for download at:

<https://www.usbr.gov/lc/region/programs/dcp.html>.

Fontenelle Reservoir -- As of March 3, 2021, the Fontenelle Reservoir pool elevation is 6474.00 feet, which amounts to 39 percent of live storage capacity. Inflows for the month of February totaled 24,000 acre-feet (af) or 87 percent of average.

Fontenelle's releases are currently set at 825 cfs. This release is scheduled to be maintained through the Fall/Winter operation period, which typically ends in late March or early April when ice on the Green River begins to thaw.

The March final forecast for unregulated inflows into Fontenelle for the next three months projects below average conditions. March, April, and May inflow volumes amount to 39,000 af (74 percent of average), 60,000 af (70 percent of average), and 95,000 af (58 percent of average), respectively.

The 2021 water year unregulated inflow volume is forecasted to be 755,000 af (70 percent of average) based on the March forecast.

The August 27, 2020, Fontenelle Working Group meeting minutes are available online on USBR's website at <https://www.usbr.gov/uc/water/crsp/wg/ft/ftcurrnt.html>. The next Fontenelle Working Group meeting is scheduled for 10:00 am on April 22, 2021. Due to the ongoing COVID pandemic this meeting will be held virtually using WebEX. The Fontenelle Working Group is an open public forum for information exchange between Reclamation and other parties associated with the operation of Fontenelle Reservoir.

Flaming Gorge -- As of March 4, 2021 Flaming Gorge Reservoir pool elevation is 6024.61 feet, which amounts to 84 percent of live storage capacity. Unregulated inflows for the month of February is approximately 31,000 acre-feet (af), which is 70% of the average February unregulated inflow volume. The average daily release is 860 cfs.

The March final forecast for unregulated inflows into Flaming Gorge for the next three months projects below average conditions. March, April and May forecasted unregulated inflow volumes amount to 70,000 af (68% of average), 90,000 af (67% of average) and 120,000 af (49% of average), respectively.

The March water supply forecast of the April through July unregulated inflow volume into Flaming Gorge Reservoir is 555,000 acre-feet (57% of average). Current snowpack is 94% of median for the Upper Green Basin.

Reclamation is planning to hold the next Flaming Gorge Working Group meeting on March 18, 2021 at 10:00 am MDT via WebEx. This will be followed up with the mid-April meeting on April 15, 2021 at 10:00 am MDT via WebEx. The Flaming Gorge Working Group is an open public forum for information exchange between Reclamation and the stakeholders of Flaming Gorge Dam. The public is encouraged to attend and comment on the operations and plans presented by Reclamation at these meetings. Meeting notes from past Working Group meetings are posted on the Working Group webpage. For more information on this group and these meetings please contact Dale Hamilton at 801-379-1186.

Aspinall Unit Reservoirs – As of March 3, 2021 releases from Crystal Dam are approximately 400 cfs. Gunnison Tunnel diversions have been terminated for the irrigation season. There will be periodic diversions to refill Fairview Reservoir about every 2 weeks throughout the winter months. Flows in the Black Canyon are about 399 cfs.

The unregulated inflow volume in February to Blue Mesa was 20,288 af (92 percent of average). Unregulated Inflow volumes forecasted for Blue Mesa for the next three months (February, March and April) are projected to be: 31,000 af (86 percent of average), 54,000 af (70 percent of average) and 140,000 af (63 percent of average), respectively. The March 24-Month Study is reflective of these new forecasts.

The 2021 water year unregulated inflow volume is projected to be 668,670 af (70 percent of average). The water supply period (April-July) for 2021 is forecasted to have 460,000 af of unregulated inflow (68 percent of average). At this point in the year there is a great deal of uncertainty for how the year will ultimately turn out. Current forecasting projects at a probability of 80 percent that the water year unregulated inflow volume to Blue Mesa will be in the range from 534,000 acre-feet to 904,000 acre-feet.

Blue Mesa is not projected to fill in 2021 under the most probable inflow scenario. Blue Mesa is projected to be at a peak elevation of approximately 7,495 feet by late July, 2021. This will be down approximately 24 feet from the full pool elevation (7,519.4 feet) and water storage in Blue Mesa at this time will be approximately 621,000 acre-feet which is 75 percent of live capacity.

The Aspinall Unit Operations Group is an open public forum for information exchange between Reclamation and the stakeholders of the Aspinall Unit. The public is encouraged to attend and comments on the operations and plans presented by Reclamation at these meetings. Meeting notes from past working Group meetings are posted on the Operations Group webpage. For more information on this group and these meetings please contact Erik Knight in the Grand Junction Area Office at (970) 248-0629.

The next Operations Group meeting would normally be held April 22, 2021. Due to the pandemic this meeting has not yet been scheduled and an information packet may be distributed for safety considerations. Contact Erik Knight in the Grand Junction Area Office for more information (970) 248-0629.

Navajo Reservoir – On March 7th, the daily average release rate from Navajo Dam was 400 cfs while reservoir inflow was averaging approximately 327 cfs. The water surface elevation was 6033.95 feet above sea level. At this elevation the live storage is 1.049 maf (62 percent of live storage capacity) and the active storage is 0.387 maf (37 percent of active storage capacity). NIIP is diverting 8 cfs. The San Juan-Chama project is not currently diverting from the basin above the reservoir. The river flow measured at the Animas River at Farmington USGS gage was at 172 cfs. River flow at the San Juan River at Four Corners USGS gage was 494 cfs.

Releases from Navajo Dam are made for authorized purposes of the Navajo Unit and are pursuant to the Record of Decision for the Navajo Reservoir Operations. Releases target the San Juan River Recovery Implementation Program's recommended downstream baseflow range of 500 cfs to 1,000 cfs through the critical habitat reach of the San Juan River (Farmington, NM to Lake Powell). Current modeling shows the release will most likely vary between 350 and 600 cfs to accomplish this for the remainder of winter and early spring. The current weekly calculated baseflow average is 501 cfs, which is within the SJRIP's recommended range.

Navajo was at 6034.3 ft of pool elevation and 1,051,940 af of storage by the end of February, which was 83 percent of average for the end of the month. The release averaged 400 cfs (as measured at the USGS San Juan at Archuleta gage) and totaled 22,020 af, which was 52 percent of average for the month. Preliminary modified unregulated inflow into Navajo was 13,600 af. Calculated evaporation for the month was 650 af. Navajo had a net storage loss of 12,700 af in February.

The most probable inflow forecast for March, April, and May is 35 kaf (33 percent of average), 75 kaf (44 percent of average), and 165 kaf (60 percent of average), respectively.

The April-July runoff forecasts are as follows:

Min Probable: 245 k af (33 percent of average, a decrease of 30 kaf since the February forecast)

Most Probable: 415 kaf (56 percent of average, a decrease of 35 kaf since the February forecast)

Max Probable: 650 kaf (88 percent of average, a decrease of 80 kaf since the February forecast)

Based on the current storage levels and inflow forecast, it is unlikely a spring peak release will be conducted at Navajo.

Reclamation conducts Public Operations Meetings three times per year to gather input for determining upcoming operations for Navajo Reservoir. Input from individuals, organizations, and agencies along with other factors such as weather, water rights, endangered species requirements, flood control, hydro power, recreation, fish and wildlife management, and reservoir levels, will be considered in the development of these reservoir operation plans. In addition, the meetings are used to coordinate activities and

exchange information among agencies, water users, and other interested parties concerning the San Juan River and Navajo Reservoir. The next meeting will be held virtually on Tuesday, April 20th, at 1:00 PM.

Glen Canyon Dam / Lake Powell

Current Status

The unregulated inflow volume to Lake Powell during February was 201 thousand acre-feet (kaf) (51% of average). The release volume from Glen Canyon Dam in February was 675 kaf. The end of February elevation and storage of Lake Powell were 3571.46 feet (128 feet from full pool) and 9.64 million acre-feet (maf) (39 % of live capacity), respectively.

The six-month period from April to December 2020 is one of the driest periods on record. Current conditions resemble 2002, 2012, 2013 and the beginning of 2018, four out of the five driest years on record.

Current Operations

The operating tier for water year 2021 (September 2020 through October 2021) was established in August 2020 as the Upper Elevation Balancing Tier, consistent with Section 6.B of the Interim Guidelines. Consistent with Section 6.B of the Interim Guidelines, Lake Powell's operations in water year 2021 will be governed by the Upper Elevation Balancing Tier. With an 8.23 maf release from Lake Powell in water year 2021, the February 2021 24-Month Study projects the end of water year elevation at Lake Powell to be below 3,575 feet, and the end of water year elevation at Lake Mead to be below 1,075 feet. Therefore, in accordance with Section 6.B.1 of the Interim Guidelines, the March 24-Month Study projects that 8.23 maf shall be released from Lake Powell in water year 2021.

In March, the release volume will be approximately 700 kaf, with fluctuations anticipated between about 8,589 cubic feet per second (cfs) in the nighttime to about 14,647 cfs in the daytime, and consistent with the Glen Canyon Dam, Record of Decision (dated December 2016). The anticipated release volume for April is 628 kaf.

The Glen Canyon Dam Planning and Implementation Team, by consensus, recommends a Spring Disturbance Flow be implemented at Glen Canyon Dam March 15 to 26, 2021. This event supports maintenance needs of the facility and advances research goals of the Glen Canyon Dam Adaptive Management Program.

Technical experts at the U.S. Geological Survey's Grand Canyon Monitoring and Research Center and Western Area Power Administration have coordinated with Reclamation operations and maintenance officials to design flow releases to optimize benefits for both dam maintenance and the aquatic ecosystem throughout Glen, Marble, and Grand Canyons while minimizing negative impacts to hydropower.

The proposed spring disturbance flow releases of 4,000 cubic feet per second for 5 days is needed to conduct maintenance on the apron of Glen Canyon Dam. This low flow will be followed by an increase in flow culminating in a peak discharge of approximately 20,150 cubic feet per second for 82 hours.

In addition to daily scheduled fluctuations for power generation, the instantaneous releases from Glen Canyon Dam may also fluctuate to provide 40 megawatts (mw) of system regulation. These instantaneous release adjustments stabilize the electrical generation and transmission system and translate to a range of about 1,100 cfs above or below the hourly scheduled release rate. Under system normal conditions, fluctuations for regulation are typically short lived and generally balance out over the hour with minimal or no noticeable impacts on downstream river flow conditions.

Releases from Glen Canyon Dam can also fluctuate beyond scheduled releases when called upon to respond to unscheduled power outages or power system emergencies. Depending on the severity of the system emergency, the response from Glen Canyon Dam can be significant, within the full range of the operating capacity of the power plant for as long as is necessary to maintain balance in the transmission system. Glen Canyon Dam currently maintains 30 mw (approximately 800 cfs) of generation capacity in reserve in order to respond to a system emergency even when generation rates are already high. System emergencies occur infrequently and typically require small responses from Glen Canyon Dam. However, these responses can have a noticeable impact on the river downstream of Glen Canyon Dam.

Inflow Forecasts and Model Projections

The forecast for water year 2021 unregulated inflow to Lake Powell, issued on March 3, 2021, by the Colorado Basin River Forecast Center, projects that the most probable (median) unregulated inflow volume this year will be 5.13 maf (47% of average).

There is significant uncertainty regarding next season's snowpack development and resulting runoff into Lake Powell. Reclamation updates the minimum and maximum probable forecasts four times a year: January, April, August, and October. Under the February minimum probable 24-Month Study, the forecast projected Lake Powell's water surface elevation to fall below 3,525 feet in 2022. This model result initiates enhanced monitoring and coordination under the Agreement for Drought Response Operations at the Initial Units of the Colorado River Storage Project Act (Drought Response Operations Agreement "DROA"). This model result does not initiate operational changes to Reclamation facilities.

The Upper Division States and the Upper Colorado River Commission (UCRC) enhanced monitoring and coordination will involve a monthly meeting communicating monthly model results from the minimum, most, and maximum projected operations. Please note that 90% of the suite of results are expected to be above the minimum probable projections and there is currently a 10% expectation to be below elevation 3525 feet under the minimum probable scenario.

The minimum probable 24-Month Study will continue showing operations under the Lower Elevation Balancing Tier (LEBT) that is pursuant to the 2007 Record of Decision on the Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations of Lake Powell and Lake Mead (Interim Guidelines).

The DROA coordination will continue until either (i) the minimum probable projected elevation remains above 3,525 feet for 24 months or (ii) the process moves to the next step when the most probable projected elevation indicates Powell elevations below 3,525 feet and a Drought Response Operations Plan is implemented.

The March forecast for water year 2021 ranges from a minimum probable of 3.49 maf (32% of average) to a maximum probable of 8.05 maf (74% of average). There is a 10% chance that inflows could be higher than the current maximum probable forecast and a 10% chance that inflows could be lower than the minimum probable forecast.

Based on the current forecast of 5.13 maf unregulated inflow, the March 24-Month Study projects Lake Powell elevation will end water year 2021 near 3,557.03 feet with approximately 8.10 maf in storage (33% of capacity). Note that projections of elevation and storage for water year 2021 have significant uncertainty at this point in the season. Projections of end of water year 2021 elevation and storage using the minimum and maximum probable inflow forecast from and results from the March 2021 DROA model runs are 3,543.92 feet (7.16 maf, 29% of capacity) and 3,578.99 feet (9.85 maf, 41% of capacity), respectively. Under these scenarios, there is a 10% chance that inflows will be higher, resulting in higher elevation and storage, and 10% chance that inflows will be lower, resulting in lower elevation and storage. The annual release volume from Lake Powell during water year 2021 is projected to be 8.23 maf under the March minimum and most probable inflow scenarios and 8.60 maf in the maximum probable scenario.

Upper Colorado River Basin Hydrology

Upper Colorado River Basin regularly experiences significant year to year hydrologic variability. During the 21-year period 2000 to 2020, however, the unregulated inflow to Lake Powell, which is a good measure of hydrologic conditions in the Colorado River Basin, was above average in only 4 out of the past 19 years. The period 2000-2020 is the lowest 21-year period since the closure of Glen Canyon Dam in 1963, with an average unregulated inflow of 8.62 maf, or 80% of the 30-year average (1981-2010). (For comparison, the 1981-2010 total water year average is 10.83 maf.) The unregulated inflow during the 2000-2020 period has ranged from a low of 2.64 maf (24% of average) in water year 2002 to a high of 15.97 maf (147% of average) in water year 2011. In water year 2018 unregulated inflow volume to Lake Powell was 4.6 maf (43% of average), the third driest year on record above 2002 and 1977. Under the current most probable forecast, the total water year 2021 unregulated inflow to Lake Powell is projected to be 5.13 maf (47% of average).

At the beginning of water year 2021, total system storage in the Colorado River Basin was 28.88 maf (48% of 59.6 maf total system capacity). This is a decrease of 2.77 maf over the total storage at the beginning of water year 2020 when total system storage was

31.64 maf (53% of capacity). Since the beginning of water year 2000, total Colorado Basin storage has experienced year to year increases and decreases in response to wet and dry hydrology, ranging from a high of 94% of capacity at the beginning of 2000 to the now current level of 48% of capacity at the beginning of water year 2021. Based on current inflow forecasts, the current projected end of water year total Colorado Basin reservoir storage for water year 2021 is approximately 24.81 maf (42% of total system capacity). The actual end of water year 2021 system storage may vary from this projection, primarily due to uncertainty regarding this season's runoff and reservoir inflow.

TO ALL ANNUAL OPERATING PLAN RECIPIENTS

MAILED FROM UPPER COLORADO REGION

WATER RESOURCES GROUP

ATTENTION UC-430

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RUNOFF AND INFLOW PROJECTIONS INTO UPPER BASIN RESERVOIRS ARE PROVIDED BY
THE COLORADO RIVER FORECASTING SERVICE THROUGH THE NATIONAL WEATHER SERVICES'S
COLORADO BASIN RIVER FORECAST CENTER AND ARE AS FOLLOWS

| : | Obs | | | | sep | Forecast | | | | |
|---------------------|------|------|------|------|------|----------|-------|-------|---------|------|
| : | nov | dec | jan | feb | %Avg | mar | apr | may | apr-jul | %Avg |
| GLDA3:Lake Powell | 261 | 168 | 198 | 201 | 51%: | 330/ | 450/ | 950/ | 3400/: | 47% |
| GBRW4:Fontenelle | 33 | 27 | 25 | 24 | 87%: | 39/ | 60/ | 95/ | 480/: | 66% |
| GRNU1:Flaming Gorge | 37 | 24 | 31 | 31 | 70%: | 70/ | 90/ | 120/ | 555/: | 57% |
| BMDC2:Blue Mesa | 25 | 21 | 22 | 20 | 89%: | 31/ | 54/ | 140/ | 460/: | 68% |
| MPSC2:Morrow Point | 27 | 24 | 23 | 21 | 84%: | 34/ | 62/ | 150/ | 500/: | 68% |
| CLSC2:Crystal | 29 | 27 | 25 | 24 | 83%: | 38/ | 71/ | 170/ | 560/: | 67% |
| TPIC2:Taylor Park | 4.1 | 3.8 | 3.6 | 3.2 | 84%: | 3.4/ | 7.0/ | 20.0/ | 71/: | 72% |
| VCRC2:Vallecito | 3.4 | 2.7 | 2.9 | 2.7 | 57%: | 3.7/ | 10/ | 40/ | 115/: | 59% |
| NVRN5:Navajo | 16.9 | 9.8 | 12.2 | 13.6 | 45%: | 35/ | 75/ | 165/ | 415/: | 56% |
| LEMC2:Lemon | 0.53 | 0.43 | 0.44 | 0.40 | 52%: | 0.7/ | 2.5/ | 12/ | 30/: | 55% |
| MPHC2:McPhee | 4.3 | 1.33 | 1.77 | 2.2 | 44%: | 6.5/ | 25.0/ | 60.0/ | 132/: | 45% |
| RBSC2:Ridgway | 3.9 | 3.2 | 2.7 | 2.6 | 72%: | 4.4/ | 7.0/ | 15.0/ | 62/: | 61% |
| YDLC2:Deerlodge | 21 | 22 | 21 | 18.3 | 65%: | 45/ | 130/ | 320/ | 825/: | 67% |
| DRGC2:Durango | 8.7 | 6.6 | 6.6 | 5.8 | 48%: | 9.0/ | 23.0/ | 75.0/ | 220/: | 53% |